TOURISM ACTIVITY PLANNING FOR MANGROVE FOREST EXPLORATION IN MUARA GEMBONG, BEKASI REGENCY (CASE STUDY: PANTAI MEKAR VILLAGE)

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Abstract

This study designs a sustainable mangrove ecotourism model in Muara Gembong, Bekasi, by integrating spatial planning (Gunn & Var, 2002) and six experiential tourism elements (Cooper et al., 2008). Using a qualitative approach and spatial analysis, the research identifies the potential of 10,481 hectares of underutilized mangrove areas, despite challenges such as plastic pollution and infrastructure limitations.

Key recommendations include infrastructure improvements, training for local guides, and plastic-free policies. The model offers a community-based tourism framework that balances ecological conservation and economic benefits, with potential for replication in other coastal areas.

Keywords: Mangrove ecotourism, spatial planning, carrying capacity, Muara Gembong, sustainable tourism.

A. INTRODUCTION

Global tourism has undergone a paradigm shift toward sustainability, where environmental conservation and community empowerment converge. This transformation is evident in the rise of nature-based tourism, particularly mangrove ecotourism, which serves dual purposes: safeguarding coastal ecosystems while stimulating local economies. Indonesia, with its 3.3 million hectares of mangrove forests—the largest globally—holds immense potential for such models. Muara Gembong in Bekasi Regency exemplifies this opportunity, where 10,481 hectares of mangrove habitat remain underutilized despite their ecological and economic value.

The site's significance extends beyond carbon sequestration and biodiversity conservation. Mangroves in Muara Gembong mitigate coastal erosion, a pressing issue for this northern Javanese community, while supporting fisheries that sustain local livelihoods. However, challenges persist. Conversion to aquaculture ponds, plastic pollution from adjacent farms, and inadequate infrastructure hinder sustainable tourism development. Existing facilities, such as the 10x15-meter shelter and 50-meter dock at Pantai Mekar, remain underused, functioning more as children's play areas than tourism hubs.

This study addresses these gaps by designing a mangrove exploration ("susur mangrove") experience anchored in Gunn & Var's (2002) Spatial Planning for Tourism and Cooper et al.'s (2008) six experiential tourism elements. The research questions focus on: (1) zoning strategies to accommodate tourism activities, (2) spatial hierarchies for visitor flow management, and (3) carrying capacity

calculations for boat-based tours. By leveraging local assets—including traditional fishing boats and Pokdarwis (tourism awareness groups)—the project aims to create a replicable model for community-based ecotourism in coastal regions.

B. RESEARCH METHOD

A qualitative development research approach guided this study, comprising four iterative phases: needs assessment, design, expert validation, and pilot testing. Data collection integrated GPS-tracked boat surveys (using GeoTraker), ethnographic interviews with stakeholders (fishers, Pokdarwis members, and local officials), and spatial analysis via SketchUp and Lumion.

The needs assessment revealed critical insights:

- Ecological Conditions: Rhizophora mucronata-dominated forests showed high biodiversity but suffered plastic waste accumulation near aquaculture zones.
- Community Readiness: Fishermen expressed willingness to repurpose boats (6-person capacity; IDR 150–200k/trip) during non-fishing hours (8–11 AM; 1–4 PM).
- Infrastructure Gaps: The 142-meter access path between shelter and dock lacked rain protection, while safety equipment (life jackets, first aid) was absent.

For the design phase, three zones were established:

1. Core Zone: Restricted mangrove areas for passive observation (birdwatching, photography).
2. Buffer Zone: Floating markets and educational stops for mangrove planting demonstrations.
3. Service Zone: Dock and shelter for ticketing and visitor orientation.

Carrying capacity was calculated using Cifuentes' (1992) formula:
KMT = 6 boats × 6 passengers × 3 trips/day × 2 time slots × 0.8 (safety factor) = 173 visitors/day.

Expert validation involved reviews by marine ecologists and tourism planners, who emphasized tidal adaptability and waste management protocols. A 60-minute pilot tour tested the itinerary's feasibility, confirming that high tide periods (optimal for navigation) aligned with peak wildlife activity at observation points.

C. RESULTS AND ANALYSIS

The study yielded a spatially optimized tourism model with multisensory experiences:

Spatial Configuration

- Nodes: The shelter (entry node), birdwatching platforms (secondary nodes), and sunset viewpoint (terminal node) formed the experiential anchors.

- Paths: A 4.1-km looped water route connected nodes, avoiding sensitive breeding grounds while maximizing biodiversity encounters.
- Districts: Tambak (aquaculture) areas were designated for educational stops, contrasting with pristine mangrove conservation zones.

Experiential Tourism Elements

1. Something to See: 82 bird species (e.g., Milky Stork, Javan Kingfisher) and lutung monkeys (Trachypithecus auratus) at designated observation points.
2. Something to Do: Guided reforestation activities and "plastic-for-souvenirs" barter systems.
3. Something to Buy: Floating market stalls selling mangrove-honey products and woven nypa handicrafts.
4. Something to Eat: On-board seafood snacks like grilled mussels with kelengkang sauce.
5. Something to Learn: AR-enabled QR codes explaining mangrove speciation at key stops.
6. Something to Feel: Sunset meditation sessions and "Letters to Mangroves" reflective writing.

Stakeholder Feedback

Pokdarwis members highlighted operational challenges:

- Tidal fluctuations required dynamic scheduling (65% of trips needed rescheduling during neap tides).
- Fishermen prioritized fishing over tourism during peak harvest seasons (May–July).

Spatial analysis showed the eastern canal's 3-meter depth accommodated boats safely, whereas western routes required dredging. Visitor flow simulations in Lumion identified bottlenecks at the dock during peak hours, prompting recommendations for staggered departures.

D. CONCLUSION

This study demonstrates that sustainable mangrove tourism requires balancing ecological limits with community livelihoods. The proposed model's innovation lies in its adaptive zoning—shifting activity nodes based on tidal cycles and wildlife patterns—and experiential layering that transforms ecological features into memorable tourism products.

Key recommendations include:

- Infrastructure Upgrades: Installing shaded walkways and modular floating docks to handle tidal variability.
- Waste Management: Implementing a "zero-plastic" policy enforced through deposit-refund schemes.
- Capacity Building: Training fishermen in interpretive guiding and safety protocols.

Future research should explore:

- Longitudinal studies on tourism's impact on mangrove regeneration rates.
- Digital tools (e.g., real-time tidal apps) for operational efficiency.

By aligning spatial planning with experiential design, Muara Gembong can emerge as a benchmark for participatory ecotourism, proving that environmental stewardship and economic vitality are not mutually exclusive but mutually reinforcing.

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PERENCANAAN AKTIVITAS WISATA SUSUR HUTAN MANGROVE DI KECAMATAN MUARA GEMBONG KABUPATEN BEKASI (STUDI KASUS DI DESA PANTAI MEKAR)

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Abstrak

Penelitian ini merancang model ekowisata mangrove berkelanjutan di Muara Gembong, Bekasi, dengan mengintegrasikan perencanaan spasial (Gunn & Var, 2002) dan enam elemen pariwisata eksperiensial (Cooper dkk., 2008). Melalui pendekatan kualitatif dan analisis spasial, studi ini mengidentifikasi potensi 10.481 hektar mangrove yang belum termanfaatkan optimal, meski menghadapi tantangan polusi plastik dan keterbatasan infrastruktur.

Rekomendasi utama meliputi peningkatan infrastruktur, pelatihan pemandu lokal, dan kebijakan bebas plastik. Model ini menawarkan kerangka kerja pariwisata berbasis masyarakat yang berimbang antara konservasi ekologis dan manfaat ekonomi, dengan potensi replikasi di kawasan pesisir lainnya.

Kata kunci: Ekowisata mangrove, perencanaan spasial, daya dukung, Muara Gembong, pariwisata berkelanjutan.

Abstract

This study designs a sustainable mangrove ecotourism model in Muara Gembong, Bekasi, by integrating spatial planning (Gunn & Var, 2002) and six experiential tourism elements (Cooper et al., 2008). Using a qualitative approach and spatial analysis, the research identifies the potential of 10,481 hectares of underutilized mangrove areas, despite challenges such as plastic pollution and infrastructure limitations.

Key recommendations include infrastructure improvements, training for local guides, and plastic-free policies. The model offers a community-based tourism framework that balances ecological conservation and economic benefits, with potential for replication in other coastal areas.

Keywords: Mangrove ecotourism, spatial planning, carrying capacity, Muara Gembong, sustainable tourism.

A. PENDAHULUAN/INTRODUCTION

Pariwisata global telah mengalami pergeseran paradigma menuju keberlanjutan, di mana pelestarian lingkungan dan pemberdayaan masyarakat bersinergi. Transformasi ini terlihat dari berkembangnya pariwisata berbasis alam, khususnya ekowisata mangrove, yang memiliki dua fungsi sekaligus: melindungi ekosistem pesisir sekaligus memacu perekonomian lokal. Indonesia, dengan 3,3 juta hektar hutan mangrove—terluas di dunia—menyimpan potensi besar untuk model ini. Muara Gembong di Kabupaten Bekasi menjadi contoh nyata, di mana 10.481 hektar habitat mangrove belum dimanfaatkan secara optimal meski memiliki nilai ekologis dan ekonomi tinggi.

Signifikansi kawasan ini melampaui penyerapan karbon dan konservasi keanekaragaman hayati. Mangrove di Muara Gembong mengurangi erosi pantai—isu krusial bagi masyarakat pesisir Jawa Utara—sekaligus menopang perikanan yang menjadi tulang punggung penghidupan warga. Namun, tantangan masih ada. Alih fungsi menjadi tambak, polusi plastik dari aktivitas perikanan sekitar, serta keterbatasan infrastruktur menghambat pengembangan pariwisata berkelanjutan. Fasilitas yang ada, seperti shelter berukuran 10x15 meter dan dermaga sepanjang 50 meter di Pantai Mekar, lebih sering digunakan sebagai area bermain anak-anak ketimbang pusat wisata.

Penelitian ini menjawab tantangan tersebut dengan merancang pengalaman "susur mangrove" berbasis Spatial Planning for Tourism (Gunn & Var, 2002) dan enam elemen pariwisata eksperiensial (Cooper dkk., 2008). Pertanyaan penelitian berfokus pada: (1) strategi zonasi untuk aktivitas wisata, (2) hierarki ruang pengelolaan arus pengunjung, dan (3) perhitungan daya dukung untuk wisata berbasis perahu. Dengan memanfaatkan aset lokal—termasuk perahu tradisional dan Pokdarwis (kelompok sadar wisata)—proyek ini bertujuan menciptakan model ekowisata berbasis masyarakat yang dapat direplikasi di wilayah pesisir.

B. METODE PENELITIAN/RESEARCH METHOD

Penelitian menggunakan pendekatan pengembangan (development research) kualitatif melalui empat fase berulang: analisis kebutuhan, perancangan, validasi ahli, dan uji coba. Pengumpulan data melibatkan survei perahu berbasis GPS (menggunakan GeoTraker), wawancara etnografis dengan berbagai pemangku kepentingan (nelayan, anggota Pokdarwis, dan pejabat lokal), serta analisis spasial via SketchUp dan Lumion.

Analisis kebutuhan mengungkap temuan kritis:

- Kondisi Ekologis: Hutan didominasi Rhizophora mucronata memiliki keanekaragaman hayati tinggi, tetapi tercemar sampah plastik di dekat zona tambak.
- Kesiapan Masyarakat: Nelayan bersedia memanfaatkan perahu (kapasitas 6 orang; Rp150–200 ribu/trip) di luar jam melaut (08.00–11.00; 13.00–16.00).
- Kesenjangan Infrastruktur: Jalur akses 142 meter antara shelter dan dermaga tidak memiliki pelindung hujan, sementara peralatan keselamatan (pelampung, P3K) tidak tersedia.

Fase perancangan membagi tiga zona:

1. Zona Inti: Area mangrove terbatas untuk observasi pasif (pengamatan burung, fotografi).
2. Zona Penyangga: Pasar apung dan titik edukasi untuk demonstrasi penanaman mangrove.
3. Zona Pelayanan: Dermaga dan shelter untuk tiket dan orientasi pengunjung.

Daya dukung dihitung dengan rumus Cifuentes (1992):

KMT = 6 perahu × 6 penumpang × 3 trip/hari × 2 slot waktu × 0.8 (faktor keamanan) = 173 pengunjung/hari.

Validasi ahli melibatkan pakar ekologi kelautan dan perencana wisata yang menekankan adaptasi pasang-surut dan protokol pengelolaan sampah. Uji coba tur 60 menit mengonfirmasi bahwa periode air pasang (optimal untuk navigasi) bertepatan dengan puncak aktivitas satwa di titik observasi.

C. HASIL DAN ANALISIS/RESULTS AND ANALYSIS

Studi ini menghasilkan model wisata yang dioptimalkan secara spasial dengan pengalaman multisensori:

Konfigurasi Spasial

- Node: Shelter (node masuk), platform pengamatan burung (node sekunder), dan titik sunset (node akhir) menjadi anchor pengalaman.
- Jalur: Rute air melingkar 4,1 km menghubungkan node, menghindari area perkembangbiakan sensitif sambil memaksimalkan pertemuan dengan keanekaragaman hayati.
- Distrik: Kawasan tambak ditetapkan sebagai titik edukasi, berbanding dengan zona konservasi mangrove alami.

Elemen Pariwisata Eksperiensial

1. Something to See: 82 spesies burung (misalnya Bangau Bluwok, Cekakak Sungai) dan lutung (Trachypithecus auratus) di titik observasi.
2. Something to Do: Aktivitas reboisasi terpandu dan sistem barter "sampah-plastik-untuk-souvenir".
3. Something to Buy: Kios pasar apung menjual madu mangrove dan kerajinan anyaman nipah.
4. Something to Eat: Cemilan seafood di perahu seperti kerang bakar dengan sambal kelengkang.
5. Something to Learn: Kode QR berbasis AR yang menjelaskan spesiasi mangrove di titik tertentu.
6. Something to Feel: Sesi meditasi sunset dan aktivitas refleksi "Surat untuk Mangrove".

Masukan Stakeholder

Anggota Pokdarwis menyoroti tantangan operasional:

- Fluktuasi pasang-surut memerlukan penjadwalan dinamis (65% trip harus dijadwal ulang saat air surut).
- Nelayan memprioritaskan melaut ketimbang wisata selama musim panen (Mei–Juli).

Analisis spasial menunjukkan kedalaman kanal timur (3 meter) aman untuk perahu, sedangkan rute barat perlu pengerukan. Simulasi arus pengunjung di Lumion mengidentifikasi kemacetan di dermaga saat jam sibuk, sehingga direkomendasikan pemberangkatan bergelombang.

D. SIMPULAN/CONCLUSION

Penelitian ini membuktikan bahwa pariwisata mangrove berkelanjutan memerlukan keseimbangan antara batas ekologis dan penghidupan masyarakat. Inovasi model terletak pada zonasi adaptif—memindahkan node aktivitas berdasarkan siklus pasang-surut dan pola satwa—serta lapisan eksperiensial yang mengubah fitur ekologis menjadi produk wisata yang berkesan.

Rekomendasi utama:

- Peningkatan Infrastruktur: Memasang jalur teduh dan dermaga apung modular untuk adaptasi pasang-surut.
- Pengelolaan Sampah: Menerapkan kebijakan "bebas plastik" melalui skema deposit-refund.

- Pengembangan Kapasitas: Melatih nelayan menjadi pemandu interpretatif dan protokol keselamatan.

Riset mendatang perlu mengeksplorasi:

- Studi longitudinal dampak wisata terhadap regenerasi mangrove.
- Alat digital (misalnya aplikasi pasang-surut real-time) untuk efisiensi operasional.

Dengan menyelaraskan perencanaan spasial dan desain eksperiensial, Muara Gembong dapat menjadi tolak ukur ekowisata partisipatif, membuktikan bahwa pelestarian lingkungan dan vitalitas ekonomi bukanlah hal yang bertentangan, melainkan saling memperkuat.

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